

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference PHUS030493WO	FOR FURTHER ACTION		See item 4 below
International application No. PCT/IB2004/052540	International filing date (<i>day/month/year</i>) 24 November 2004 (24.11.2004)	Priority date (<i>day/month/year</i>) 11 December 2003 (11.12.2003)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant KONINKLIJKE PHILIPS ELECTRONICS, N.V.			

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																
2.	This REPORT consists of a total of 7 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;"><input checked="" type="checkbox"/> Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/> Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/> Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/> Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/> Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/> Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/> Box No. I	Basis of the report	<input type="checkbox"/> Box No. II	Priority	<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/> Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/> Box No. VI	Certain documents cited	<input checked="" type="checkbox"/> Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/> Box No. VIII	Certain observations on the international application
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4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 12 June 2006 (12.06.2006) Authorized officer <p style="text-align: center; font-weight: bold;">Cecile Chatel</p>
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PATENT COOPERATION TREATY

REC'D 27 APR 2005

From the
INTERNATIONAL SEARCHING AUTHORITY

WIPO PCT

PCT

To:

see form PCT/ISA/220

30/6

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2004/052540

International filing date (day/month/year)
24.11.2004

Priority date (day/month/year)
11.12.2003

International Patent Classification (IPC) or both national classification and IPC
G01S15/89

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2004/052540

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2004/052540

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V.

- 1 Reference is made to the following document:

D1 : US 6 503 199 B1 (LENNON DANIEL) 7 January 2003 (2003-01-07)

2. Independent Claim 1.

Document D1, which is considered to represent the most relevant state of the art, discloses (see passages cited in the search report): a method of producing a volumetric ultrasound image, comprising:

- using a two-dimensional array transducer to scan a region of interest in an azimuthal direction using a plurality of beams that have a common center axis,
- projecting ultrasound reflections in each beam onto a common plane of projection; and
- creating the volumetric ultrasound image from the ultrasound reflections projected onto the common plane of projection for all of the beams.

From this, the subject-matter of independent claim 1 differs in that:

- the beams diverge in an elevational direction in respective divergence angles that are different for each beam, the beams scanning respective ranges of scanning depths are ordered inversely to an order of divergence angles of the beams so that a beam scanning the shallowest range of scanning depths has the largest divergence angle and a beam scanning the deepest range of scanning depths has the smallest divergence angle.

- 2.1 The subject-matter of claim 1 is therefore novel (Article 33(2) PCT)

The problem to be solved by the present invention may be regarded as: reduce image distortions due to the polar scanning.

- 2.2 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: the use of beamwidths which depend on the scanning depth is not disclosed in D1, and on the basis of the available prior art it would not be possible for the man skilled in the art to arrive to it without exercising an inventive activity.

- 2.3 Claims 2-4 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3 Independent claim 5.

Document D1, which is considered to represent the most relevant state of the art, discloses (see passages cited in the search report): a method of producing a volumetric ultrasound image, comprising:

- using a two-dimensional array transducer to scan a region of interest in an azimuthal direction
- projecting ultrasound reflections at each range of scanning depths onto a plane of projection; and
- creating the volumetric ultrasound image from the ultrasound reflections projected onto the plane of projection.

From this, the subject-matter of independent claim 5 differs in that:

- it uses a beam that diverges in an elevational direction, the beam scanning a plurality of ranges of scanning depths using respective divergence angles that are ordered inversely to the ranges of scanning depths so that when the beam scans the shallowest range of scanning depths it has the largest divergence angle and when the beam scans the deepest range of scanning depths it has the smallest divergence angle.

3.1 The subject-matter of claim 5 is therefore novel (Article 33(2) PCT)

The problem to be solved by the present invention may be regarded as the same as claim 1.

3.2 The solution to this problem proposed in claim 5 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the same reasons used for claim 1.

3.3 Claims 6-8 are dependent on claim 5 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

4 Independent claim 9.

This claim meets the requirements of novelty (Article 33(2) PCT) and inventive step (Article 33(3) PCT), see mutatis mutandis the same reasoning used for claim 1.

4.3 Claims 10, 11 are dependent on claim 9 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VII.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/IB2004/052540

1. The Independent claim should be written in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble and with the remaining features being included in the characterising part.
2. To meet the requirements of Rule 5.1(a)(ii) PCT, the document D1 should be identified in the description and the relevant background art disclosed therein should be briefly discussed.
3. When filing amended claims the applicant should at the same time bring the description into conformity with the amended claims (Rule 5.1(a)(iii) PCT).

Re Item VIII.

1. The application should contain only one independent claim in a particular category.
2. Care should be taken to avoid drafting non-unitary independent claims containing diverging subject matter which may be open to a subsequent objection under Rule 13.1 PCT.
3. In the description, page 2 lines 5-6, a cited document is "incorporated by reference". This renders the description unclear and as such the claims, when the description is used to interpret them (Article 6 PCT). The expression should be removed.
4. The vague and imprecise statement in the description on page 11, line 28, implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.